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EPA Superfund
Explanation of Significant Differences:

BATTERY TECH (DURACELL-LEXINGTON)
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LEXINGTON, NC
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EXPLANATION OF SIGNIFICANT DIFFERENCE TO THE OPERABLE UNIT 1 REMEDIAL ACTION FOR THE BATTERY TECH DURACELL SITE LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA Site ID # NCD 000 648 402

PREPARED BY:

US. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

SEPTEMBER 2002

EXPLANATION OF SIGNIFICANT DIFFERENCE
TO THE OPERABLE UNIT 1 REMIEDIAL ACTION
FOR THE BATTERY TECH DURACELL SITE
LEXINGTON, DAVIDSON COUNTY, NORTH CAROLINA

1.0 INTRODUCTION

Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.435 (c) (2) (i) of the National Contingency Plan (NCP) require that the EPA publish an Explanation of Significant Difference (ESD) when significant changes in a Superfund remedy occur after the Record of Decision (ROD) is signed. The purpose of this ESD is to notify all parties of concern that the Environmental Protection Agency is enacting significant changes to the Operable Unit 1 (OU1) Remedial Action based on information received subsequent to the signing of the ROD. EPA-Region IV believes these significant changes will enhance the effectiveness of the OU1 remedy.

A copy of this ESD will be added to the Battery Tech Duracell Site Administrative Record and Information Repository. The Administrative Record and Information Repository can be found in the Davidson County Library located in Lexington, North Carolina, and in the Information Center at the EPA-Region IV Office in Atlanta, Georgia (both addresses are provided at the end of this document). The public is encouraged to review the Administrative Record at either of these locations.

2.0 SITE LOCATION AND DESCRIPTION

The active, 27.5-acre battery manufacturing facility is currently owned and operated by the Gillette Company, corporate owner of Duracell. The Site is located at 305 New Highway 64 in Lexington, Davidson County, North Carolina. The operating facility consists of three main buildings; Plant #1, Plant #3, and building #4. Plant #1 is the battery cell assembly operation where chemicals are mixed and laced into containers to make batteries. Plant #2 was the building where mercuric oxide was formulated from 1977 to 1986. Mercury reclamation operations also took place on the east side of Plant #2 from 1977 to 1986. A small wastewater treatment system consisting of two concrete-lined sumps was also in operation at Plant #2 prior to installation of the Memtek treatment system at building #4. Plant #2 was demolished and removed from the Site in 1995. Plant #3 was purchased in 1976 and is utilized for testing, packaging, and shipping and receiving. Building #4 was built in 1981 to house the mercury reclamation furnace; this building is now used to temporarily store hazardous waste and house the wastewater treatment system.

3.0 SITE HISTORY

Site operations over the years resulted in extensive mercury and manganese contamination in the soil and ground water at the Site. One source of mercury contamination in the soil involved the past operations in the area of Plant #2. Another source of mercury contamination in the soil

involved spillage while transporting the mercuric oxide from Plant #2 to Plant #1. The mercury contamination will be addressed during the OU1 Remedial Action. Leaching of the mercury from the soil into the ground water resulted in mercury ground water contamination. Mercury is present in on-site ground water at levels significantly higher than both State and Federal drinking water standards.

Runoff from the Site over the years has also resulted in elevated levels of mercury in the sediment of the surface water pathways draining the Site, including the unnamed tributary of Fritz Branch, Leonards Creek, and Abbotts Creek southward to High Rock Lake. A 1981 fish tissue study conducted in Abbotts Creek and High Rock Lake revealed levels of mercury in excess of one part-per-million (ppm). Since these levels of mercury in fish are considered unsafe for human consumption, a fish advisory was placed on portions of Abbotts Creek and High Rock Lake in June 1981. In 1992, the measured levels of mercury in the fish decreased below the one ppm level, and the fish advisory was lifted. Since that time, mercury concentrations in fish have continued to decline and NCDENR has determined that Abbotts Creek is now fully supporting its designated uses. The mercury contamination in sediment in the upper 2,000 feet of the unnamed tributary will be addressed during the OU1 Remedial Action.

Volatile organic compounds (VOCs) such as acetone, methylene chloride, trichloroethene, tetrachloroethene, 1,1,1-trichloroethane, and 1,1,2-trichloroethane were used in the past at the Site as cleaning solvents to clean tools, dyes, presses, watch batteries, etc. The solvents were routinely disposed of in an unlined pit located between Building #4 and Plant #1 from the early 1960s to 1970s. As a result, the soil in the area of the former disposal pit contains volatile organic compounds. On-site ground water became contaminated as the VOCs migrated from the soil downward into ground water. Elevated levels of VOCs have also been identified in soil and ground water in the Plant #1 area. VOC contamination exists in the ground water at levels in excess of State and Federal drinking water standards. The ground water contamination will be addressed during the OU2 Remedial Action.

4.0 SUMMARY OF THE OU1 REMEDY

The OU1 ROD, signed in September 1999, documents the selection of Alternative 5 as the OU1 Remedy to address contaminated soil and sediment, as well as ecological concerns, at the Duracell Battery Tech site. The major components of the OU1 remedy include:

- in-situ stabilization/solidification of contaminated soil in the former Plant #2 area, followed by capping of the former Plant #2 area;

- in-situ chemical oxidation of contaminated soil in the former solvent pit area, followed by capping of the former solvent disposal area;

- selective excavation and off-site disposal of contaminated soil in the building #4 area and the northern site area, and contaminated soil and sediment located outside the facility

fence line;

- capping of other designated areas inside the facility fence line for ecological concerns; and

- long-term monitoring of site-related contamination in soil, sediment, and ecological receptors.

5.0 DESCRIPTION OF SIGNIFICANT CHANGES AND BASIS FOR THE DIFFERENCE

The 1991 OU1 ROD required a treatability study (lab-scale tests) during the OU1 Remedial Design to determine if the soil cleanup levels established in the OUl ROD for the site-related COCs, namely mercury and manganese, could be achieved using stabilization/solidification. The results of the lab-scale tests indicated that the cleanup levels for mercury and manganese could be achieved using stabilization/solidification.

Field demonstrations were conducted during the initial phase of the OU1 Remedial Design to evaluate the technical feasibility of the in-situ stabilization/solidification technology. Technical difficulties were encountered during the field demonstrations; for example, problems were encountered installing the equipment used to deliver the stabilizing/solidifying agents/reagents into the subsurface soil. These difficulties raised concerns about the implementability of the in-situ stabilization/solidification technology at the Site. The presence of mercury below the ground water table in the former Plant #2 area, and the relatively low permeability of the soils at the Site, also raised doubts whether uniform treatment of subsurface soils could be accomplished using the in-situ stabilization/solidification treatment process.

Based on the concerns regarding the implementability, as well as the short- and long-term effectiveness of the in-situ stabilization/solidification treatment process, the EPA, NCDENR, and Gillette/Duracell agreed to re-evaluate and re-consider other potential technologies identified in the OU1 Feasibility Study.

After re-evaluating the potential technologies identified in the OU1 Feasibility Study, the EPA, the State, and Gillette/Duracell agree to make the following changes to the OU1 remedy. These changes include the following:

- in lieu of using in-situ stabilization/solidification to treat contaminated soil in the former Plant #2 area, the contaminated soil will be treated on-site using ex-situ stabilization/solidification; the contaminated soils and a reagent mixture will be mechanically mixed and backfilled into a consolidation cell constructed in the former Plant #2 area; the reagent mixture of 10% Portland Cement, 5% lime, and 2.5 % sodium sulfide will be used since it proved to be the most effective mixture during the treatability study;

- in lieu of using excavation and off-site disposal for contaminated soils in the former

- solvent disposal pit area, the Building #4 area, the Northern Site area, and other designated areas located inside the facility fence line, the soils will be excavated and treated on-site with ex-situ stabilization/solidification, along with the soil in the former Plant #2 area;

- in lieu of excavating several on-site areas at depths below 15 feet below land surface to remove small areas with elevated levels of mercury or manganese, the areas will be capped with concrete to reduce the potential of contaminants in the deep subsurface soil from migrating into ground water;

- a Corrective Action Management Unit (CAMU) will be established for the on-site area where the excavation, storage, and treatment of contaminated soils will take place;

- a consolidation cell will be constructed in the former Plant #2 area, within the established CAMU, to contain the treated soils. The consolidation cell is designed to meet the technical requirements of a CAMU land-based unit as identified in 40 CFR 264 Subpart S. A woven fabric or filter fabric will be placed over a leachate collection system in the bottom of the consolidation cell as an extra measure to reduce the potential of the contaminants in the treated soil from migrating into ground water. Water from the leachate collection system will be pumped into the on-site ground water treatment system, treated, and discharged to the City of Lexington wastewater treatment system. Once all contaminated soils have been treated and backfilled into the consolidation cell, a plastic liner will be placed on top of the consolidation cell, and covered with 2 feet of soil and vegetation.

Table 1 shows a complete summary of the changes from the original remedy in the 1999 OU1 ROD to the revised remedy in the Final OU1 RD Report, dated September 2002.

6.0 EVALUATION OF PROPOSED REMEDY BASED ON NINE EVALUATION CRITERIA

Short-term effectiveness - The excavation of contaminated soil, and the mixing of the stabilizing agents with the soil, can be monitored by direct observation during the ex-situ treatment process; by comparison, excavation and mixing can not be observed using the in-situ treatment process. The estimated remediation process would require 7 to 14 days of curing time to achieve design standards. Workers implementing the ex-situ Stabilization/Solidification could be exposed to air-borne particles or vapors containing COCs, particularly during the excavation and Stabilization/Solidification treatment process. This exposure will be minimized using monitoring and engineering controls.

Reduction of Toxicity, Mobility, or Volume Through Treatment - The toxicity of the COCs will be reduced using two on-site treatment technologies, ex-situ Stabilization/Solidification and in-situ chemical oxidation. The treatability studies indicated ex-situ Stabilization/Solidification and

in-situ chemical oxidation processes can effectively reduce the toxicity and mobility of the COCs. The volume of contaminated soil and sediment outside the facility fence line will be effectively reduced with excavation and off-site disposal. The addition of the stabilizing agents will increase

Table 1 - Summary of Changes From Original Remedy to Modified Remedy

ORIGINAL REMEDY	MODIFIED REMEDY
In-situ Stabilization/Solidification of contaminated soil in the former Plant #2 area, followed by capping of the former Plant #2 area	Excavation and ex-situ stabilization/solidification of contaminated soil in the former Plant #2 area; treated soils will be placed in consolidation cell
In-situ chemical oxidation of contaminated soil in the former solvent pit area, followed by capping of the former solvent pit area	Top 1.5 feet of contaminated soil in former solvent pit area will be excavated and treated with ex-situ Stabilization/Solidification, then backfilled into consolidation cell; the remainder of the soil will still be treated with in-situ chemical oxidation
Selective excavation and off-site disposal of contaminated soil in the building #4 area, the northern site area, and contaminated soil and sediment located outside the facility fence line	Selective excavation of contaminated soils in building #4 area and northern site area, on-site treatment with ex-situ Stabilization/Consolidation, then backfilled into consolidation cells. Soils in a few on-site locations at depths of 15 feet below land surface previously designed for excavation of elevated manganese will be left in place, and the locations capped with concrete. Contaminated soil and sediment outside the facility fence line would still be excavated and transported off-site for disposal. Excavated areas would be backfilled with clean soil.
Capping of other designated areas inside the facility fence line for ecological concerns	Soils in other designated areas inside the facility fence line having ecological concerns will be excavated and treated on-site with ex-situ Stabilization/Solidification, then backfilled into consolidation cell

TABLE 1 – Summary of Changes From Original Remedy to Revised Remedy (Continued)	
Long-term monitoring of site-related soil, sediment and ecological receptors to ensure original remedy remains protective of human health and environment. Institutional controls will be applied on portions of the facility to limit future land use in those areas.	Long-term monitoring of site-related soil, sediment, and ecological receptors to ensure revised remedy remains protective of human health and the environment. Institutional controls will be applied on portions of the facility to limit future land use in those areas.
Estimated cost of using in-situ stabilization/solidification = $3,000,000	Estimated cost of using ex-situ stabilization/solidification = $3,800,000

the overall volume of the treated soil by 25 to 40 percent; this has been accounted for in the design of the consolidation cell.

Long-term Effectiveness and Permanence - Treated soils will be placed in the consolidation cell; the design of the cell includes a cap, a double liner, and leachate collection system. Designated soil and sediment located outside the facility fence line will be excavated and transported off-site for disposal. Use of the consolidation cell to house treated soils, plus the off-site disposal of soil and sediment, and deed restrictions prohibiting use of the former Plant #2 area, will increase the long-term effectiveness and permanence of the OU1 remedy.

Compliance with Applicable or Relevant and Appropriate Requirements - All applicable chemical-, action-, and location-specific requirements involving the excavation and management of soil during the ex-situ Stabilization/Solidification treatment process, the in-situ chemical oxidation process, the excavation/off-site transportation of soil, and sediment dredging activities, will be achieved or the substantive requirements of the permit will be met (e.g., Air Emissions Permit for Construction, CAMU regulations, Erosion and Sediment Control, NPDES Storm Water General Permit, Dredge and Fill Permit, Underground Injection Control Permit). For example, engineering controls will be used to minimize dust emissions and soil/sediment erosion. Worker health and safety will be complied with by providing and implementing a health and safety plans in compliance with 29 CFR 1910.120(b)(4). Soils that will be transported off-site for disposal will be assessed to ensure that applicable RCRA requirements are met.

Protection of Human Health and the Environment - Soils located both inside and outside the facility fence line containing COCs (namely mercury and manganese) above the health-based remediation levels will be treated with ex-situ Stabilization/Solidification. Use of ex-situ Stabilization/Solidification and the consolidation cell will effectively reduce the potential for direct contact risks to humans and ecological receptors, and provide protection of ground water.

Implementability - Ex-situ Stabilization/Solidification is a proven and well-documented treatment technology. Typical applications require conventional materials-handling equipment, and are readily available. The mixing process can be monitored by direct observation during the ex-situ treatment process. Furthermore, ex-situ Stabilization/Solidification generally requires a shorter treatment time than in-situ Stabilization/Solidification; therefore, there is less variability regarding the uniformity of treatment because of the inherent variability in soil and reagent mixing.

The treatability studies conducted during the OU1 Remedial Design identified the mix design and the quantities of reagent needed to successfully achieve the soil remediation levels in the OU1 ROD by implementing Stabilization/Solidification and Chemical Oxidation treatment processes.

Cost - The cost of implementing the ex-situ Stabilization/Solidification treatment technology in the revised remedy will be higher than the cost of implementing the in-situ Stabilization/Solidification treatment technology in the original remedy. The 1999 ROD estimated the present worth cost of the in-situ stabilization/solidification process to be $3,000,000. By comparison, the estimated costs for the proposed changes in this ESD, including ex-situ stabilization/solidification, are $3,800,000. The major reasons for the increased cost of the ex-situ stabilization/solidification include the excavation/handling costs associated with soils prior to and following treatment, and the construction and maintenance costs associated with the consolidation cell used to house the treated soils.

State Acceptance - The North Carolina Department of Environment and Natural Resources (NCDENR) agrees with EPA that the ex-situ Stabilization/Solidification of soils and the use of a consolidation cell will provide a better remedy than in-situ Stabilization/Solidification for the following reasons. Ex-situ Stabilization/Solidification is a proven technology which has been used successfully at other remediation sites for various remediation wastes. The short-term effectiveness of the ex-situ Stabilization/Solidification can be monitored by directly observing the mixing and curing of the reagents with the contaminated soil. While the estimated costs for ex-situ treatment exceed the estimated costs of in-situ treatment, the use of ex-situ Stabilization/Solidification increases the State's level of confidence that the OU1 remedy will achieve the remediation levels established in the OU1 ROD. The added protection of ground water afforded by the use of the consolidation cell also increases the State's level of acceptance.

Community acceptance - Community acceptance for the use of ex-situ Stabilization/Solidification should be similar or higher than for in-situ Stabilization/Solidification since ex-situ technologies are proven, and the use of a consolidation cell following treatment will increase the level of protection for ground water. EPA will mail a fact sheet to everyone on the Site mailing list, as well as a public notice, to inform local citizens about the significant changes documented in this ESD.

EPA-Region 4 and NCDENR agree that the Remedial Action Objectives in the OU1 ROD, including the overall protection of human health and the environment, can be achieved more

effectively using the remedy changes proposed in this Explanation of Significant Difference.

7.0 AFFIRMATION STATUTORY DETERMINATIONS

EPA-Region 4 and NCDENR believe that the changes made to the remedy increase the protectiveness of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to this Remedial Action, and are cost-effective. In addition, the changes described this ESD utilize permanent solutions and alternative technologies to the maximum extent practicable for this Site. All soil remediation levels and ARARs in the original remedy are unchanged by this ESD.

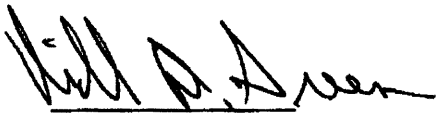
8.0 PUBLIC PARTICIPATION ACTIVITIES

This ESD will be added to the Administrative Record for the Battery Tech Duracell Superfund Site. Copies of the Administrative Record are kept at the two locations shown below:

Davidson County Public Library
602 South Main Street
Lexington, North Carolina

Environmental Protection Agency
Region IV Records Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-3104

These records are available for public review during normal working hours.



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Richard D. Green
Director, Waste Management Division

Date

North Carolina
Department of Environment and Natural Resources

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To Ken Mallary	From David Lown
Co. EPA	Co. NC Superfund
Dept.	Phone # 919 733-2801
Fax # 404 562-8788	Fax # 919 733-4811

Michael F. Easley, Governor
William G. Rose Jr., Secretary
Dexter R. Matthews, Director

September 26, 2002

Mr. Ken Mallary
Remedial Project Manager
US EPA Region IV
61 Forsyth Street, Eleventh Floor
Atlanta, GA 30303

RE: Conditional State Concurrence
Explanation of Significant Differences to the Original Record of Decision (ROD)
Duracell-Lexington
Lexington, Davidson County, North Carolina

Dear Mr. Mallary:

The North Carolina Superfund Section has received and reviewed the attached Explanation of Significant Difference (ESD) to the original Record of Decision (ROD) for the Duracell Lexington Superfund Site and concurs with the changes to the original ROD. The necessary changes to the original resulted in the significant differences explained in the attached ESD for the subject Site. The following conditions apply to the States concurrence.

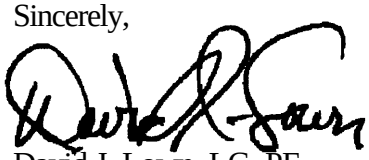
1. Our concurrence on this ESD as with the original ROD and of the associated changes to the selected remedies for the site is based solely on the information contained in the attached ESD and to the conditions listed here. Should we receive additional information that significantly affects the conclusions or remedies contained in this ESD, we may modify or withdraw this concurrence with written notice to the EPA Region IV.

2. Our concurrence on this ESD in no way binds the State to concur in future decisions or commits the State to participate, financially or otherwise, in the cleanup of the Site. The State reserves the right to review, comment, and make independent assessments of all future work relating to this Site.

3. If, after remediation is complete, the total residual risk level exceeds 10^{-6}, the State will require deed recordation/restriction to document the presence of residual contamination and possibly limit future use of the property as specified in NCGS 130A-310.8.

We appreciate the opportunity to comment on this ESD and the original ROD and look forward to continuing to work with EPA to remediate this Site.

Sincerely,



David J. Lown, LG, PE
Acting Head, Federal Remediation Branch
Superfund Section

Attachment

cc: Phil Vorsatz
Randy McElveen